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Frequency of nasal colonization and antimicrobial resistance pattern of Methicillin susceptible and resistant Staphylococcus aureus strains among nursing staffs in a Teaching University Hospital, Ardabi

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Introduction & Objectives: Staphylococcus aureus is one of the most common causes of nosocomial infections. In many cases the bacterium is transmitted via nasal carrier healthcare providers or hospital environment. Colonized healthcare providers are generally asymptomatic, but create a potential reservoir of infection for susceptible patients. The aim of this study was to find the extent of staphylococcal carriages including Methicillin susceptible (MSSA) and resistant (MRSA) S. aureus in Nursing staffs and evaluation of its antimicrobial resistance profile in a teaching university hospital in Ardabil.

Materials & Methods: In this cross-sectional study nasal swabs of 173 nursing staff in different wards were collected, and tested for detection of staphylococci strains. The isolates were identified as S. aureus based on catalase, coagulase, mannitol fermentation and DNase tests. The MRSA strains were detected using oxacillin powder by agar dilution method and antimicrobial resistance pattern of other commonly used antibiotics were determined by Disk Diffusion Method according to CLSI. Additionally the MIC (Minimum inhibitory concentration) of isolates against vancomycin was determined.

Results: Screening identified 41 (23.69%) out of 173 employees as S.aureus carriers including 35 (20.23%) MSSA and 6 (3.46%) MRSA carrier. The highest rate of MRSA carriage was found in surgical ward. Among 41 isolates 6 (15%) were resistant to methicillin. The MICs for oxacillin and vancomycin against MRSA strains was ≥128 µg/ml and ≤ 0.25 µg/ml respectively. No resistance was observed against vancomycin. High levels MRSA resistance to several commonly used antibiotics was observed. More than 83% of MRSA stains were resistant to ceftriaxone, clindamycin, cefazolin and 66.6% of isolates were resistant to rifampicin and imipenem. Amoxiclav with 100% showed the highest and the ciprofloxacin (0 %) and Co-trimoxazole (1.66%) showed lowest resistance rate against MRSA isolates respectively. However 2 (33.3 %) of MRSA isolates had intermediate resistance pattern against ciprofloxacin. MSSA isolates were sensitive against most antibiotics. The highest resistance rate was observed against amoxiclav with 57.7% of isolates followed by clindamycin with 2.85%. Ciprofloxacin and cefazolin with 5.7 % and 14.2 % showed intermediate resistance pattern respectively .

Conclusion: MRSA carriage among nurses in some wards was high and the isolates were multidrug-resistant. Because the nurses are in close contact with patients if isolates transmitted to the critically-ill patients it may lead to increased morbidity and mortality. We recommend that nursing staff should be examined for MRSA.